CLAIMS AMENDMENTS

Please cancel Claims 1, 2 and 4, and add new Claim 28 as follows:

1.-2. (Cancelled)

3. (Currently Amended) ~~A device~~ An image pickup apparatus according to Claim ~~1~~ 28, wherein said photoelectric conversion unit includes an embedded photodiode.

4. (Cancelled

5. (Previously Presented) An image pickup device comprising:

a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a transfer switch to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit to read out the signal from said semiconductor area; and

a drive circuit coupled to said pixels and to output a signal for controlling said transfer switch so that a time during which said transfer switch changes from an ON state to an OFF state becomes longer than a time during which said transfer switch changes from the OFF state to the ON state.

6. (Original) A device according to Claim 5, wherein said read unit includes an amplification transistor for amplifying and outputting the signal in said semiconductor area.

7. (Original) A device according to Claim 5, wherein said photoelectric conversion unit includes an embedded photodiode.

8. (Original) A device according to Claim 5, further comprising

an analog/digital conversion circuit adapted to convert a signal from each of said plurality of pixels into a digital signal,

a signal processing circuit adapted to process the signal from said analog/digital conversion circuit, and

a recording circuit adapted to record the signal processed by said signal processing circuit.

9. (Withdrawn) An image pickup device comprising:

a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a transfer switch adapted to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit adapted to read out the signal from said semiconductor area; and

a drive circuit adapted to control said transfer switch,

wherein a substantial driving force of said drive circuit for changing said transfer switch from an OFF state to an ON state is higher than a substantial driving force for changing said transfer switch from the ON state to the OFF state.

10. (Withdrawn) A device according to Claim 9, wherein said read unit includes an amplification transistor for amplifying and outputting the signal in said semiconductor area.

11. (Withdrawn) A device according to Claim 9, wherein said photoelectric conversion unit includes an embedded photodiode.

12. (Withdrawn) A device according to Claim 9, further comprising

an analog/digital conversion circuit adapted to convert a signal from each of said plurality of pixels into a digital signal,

a signal processing circuit adapted to process the signal from said analog/digital conversion circuit, and

a recording circuit adapted to record the signal processed by said signal processing circuit.

13. (Withdrawn) An image pickup device comprising:

a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a transfer switch adapted to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit adapted to read out the signal from said semiconductor area; and

a drive circuit adapted to control said transfer switch,

wherein said transfer switch comprises a transistor of a first conductivity type, and said drive circuit includes at least a structure formed by connecting the transistors of the first conductivity type in series.

14. (Withdrawn) A device according to Claim 13, wherein said read unit includes an amplification transistor for amplifying and outputting the signal in said semiconductor area.

15. (Withdrawn) A device according to Claim 13, wherein said photoelectric conversion unit includes an embedded photodiode.

16. (Withdrawn) A device according to Claim 13, further comprising

an analog/digital conversion circuit adapted to convert a signal from each of said plurality of pixels into a digital signal,

a signal processing circuit adapted to process the signal from said analog/digital conversion circuit, and

a recording circuit adapted to record the signal processed by said signal processing circuit.

17. (Previously Presented) An image pickup device comprising:

a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a

transfer switch to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit to read out the signal from said semiconductor area; and

a drive circuit coupled to said pixels and to output a signal adapted to control said transfer switch so that a fall speed Voff for changing said transfer switch from an ON state to an OFF state has a relation 10 V/μsec > Voff.

18. (Original) A device according to Claim 17, wherein said read unit includes an amplification transistor for amplifying and outputting the signal in said semiconductor area.

19. (Original) A device according to Claim 17, wherein said photoelectric conversion unit includes an embedded photodiode.

20. (Original) A device according to Claim 17, further comprising

an analog/digital conversion circuit adapted to convert a signal from each of said plurality of pixels into a digital signal,

a signal processing circuit adapted to process the signal from said analog/digital conversion circuit, and a recording circuit adapted to record the signal processed by said signal processing circuit.

21. (Withdrawn) An image pickup device comprising:

a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a

transfer switch adapted to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit adapted to read out the signal from said semiconductor area; and

a drive circuit adapted to control said transfer switch,

wherein said drive circuit includes a constant current circuit.

22. (Withdrawn) A device according to Claim 21, wherein said read unit includes an amplification transistor for amplifying and outputting the signal in said semiconductor area.

23. (Withdrawn) A device according to Claim 21, wherein said photoelectric conversion unit includes an embedded photodiode.

24. (Withdrawn) A device according to Claim 21, further comprising

an analog/digital conversion circuit adapted to convert a signal from each of said plurality of pixels into a digital signal,

a signal processing circuit adapted to process the signal from said analog/digital conversion circuit, and

a recording circuit adapted to record the signal processed by said signal processing circuit.

25. (Previously Presented) A drive method for an image pickup device including a plurality of pixels each including a photoelectric conversion unit, a semiconductor

area to which a signal from said photoelectric conversion unit is transferred, a transfer switch to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit to read out the signal from said semiconductor area, comprising:

an output step of outputting a first drive signal level at which said transfer switch is set in an OFF state, a second drive signal level at which said transfer switch is set in an ON state, and a third drive signal level between the first drive signal level and the drive signal second level,

wherein the third drive signal level is held for a predetermined time while said transfer switch is changing from the ON state to the OFF state.

26. (Previously Presented) A drive method for an image pickup device including a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a transfer switch to transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit to read out the signal from said semiconductor area, comprising:

an output step of outputting a drive signal to control said transfer switch so that a time during which said transfer switch changes from an ON state to an OFF state becomes longer than a time during which said transfer switch changes from the OFF state to the ON state.

27. (Previously Presented) A drive method for an image pickup device including a plurality of pixels each including a photoelectric conversion unit, a semiconductor area to which a signal from said photoelectric conversion unit is transferred, a transfer switch to

transfer the signal from said photoelectric conversion unit to said semiconductor area, and a read unit to read out the signal from said semiconductor area, comprising:

an output step of outputting a drive signal to control said transfer switch so that a fall speed Voff for changing said transfer switch from an ON state to an OFF state has a relation 10 V/sec > Voff.

28. (New) An image pickup apparatus comprising:

a photoelectric conversion unit;

a transfer switch for transferring a carrier in the photoelectric conversion unit;

an amplifying unit for amplifying a signal based on the carrier and having an input unit which inputs the carrier transferred by the transfer switch;

a reset element for resetting the input unit, wherein the reset unit resets the input unit when the reset unit is in an ON state; and

a driving circuit for driving the transfer switch,

wherein the driving circuit supplies the transfer switch with a driving signal having a level which is changed between a first level for changing the transfer switch into an OFF state, a second level for changing the transfer switch into an ON state, and a third level intermediate between the first and second levels, and

wherein the driving signal of the third level is supplied to the transfer switch after termination of a carrier storage period in the photoelectric conversion unit, during a period of a transition of the driving signal from the second level into the first level, and while the reset element is an OFF state.